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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,709	12/04/2003	Zhenan Bao	BAO 39	6929

47394 7590 08/04/2005

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EXAMINER
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LOUIE, WAI SING

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 08/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/727,709	Applicant(s) BAO, ZHENAN	
	Examiner Wai-Sing Louie	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/30/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-n are rejected under 35 U.S.C. 102(e) as being anticipated by Ong et al. (US 6,777,529).

With regard to claim 1, Ong et al. disclose a polythiophene device, including organic field effect transistor, OFET, (col. 13, line 55 to col. 19, line 67 and fig. 1), comprising:

- a substrate 16 having a surface (col. 13, line 60 and fig. 1);
- an organic field effect transistor 10 located adjacent the surface of the substrate 16, the transistor 10 comprising a gate 18, a channel 12, a source electrode 20, and a drain electrode 22 (fig. 1);
- Although, Zhang et al. do not specifically state that the channel comprises a densified layer of organic molecules with conjugated multiple bonds, axes of the organic molecules being oriented substantially normal to the substrate. However, since Zhang et al. disclose the claimed structure and the same organic compound, polythiophene as disclosed in the instant specification, it is clear that such a material results in the densified layer of organic molecules with conjugated

multiple bonds, axes of the organic molecules being oriented substantially normal to the substrate and is thus an inherent feature of the claimed semiconductor device.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-5 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ong et al. (US 6,777,529).

With regard to claims 2-5 and 8-10, Ong et al. do not disclose:

- the surface density of the organic molecules is about 7 molecules/nm<sup>2</sup>;
- the average separation between organic molecules is less than 3.8 Å;
- the polarization ratio of the organic molecules is greater than 1;
- coplanar aromatic groups, linear organic molecules, and covalently bonded to the surface.

However, where the claimed and the prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

With regard to claim 11, Ong et al. disclose the mobility of the device is  $2.3 \times 10^{-3}$   $\text{cm}^2/\text{V} \cdot \text{sec}$  (col. 17, line 32). Since the applicant has not established the criticality of the mobility stated and since these mobilities are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device. Where patentability is said to be based upon particular chosen dimension or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ong et al. (US 6,777,529) in view of Speakman (US 6,713,389).

With regard to claims 6-7, Ong et al. do not disclose the substrate 16 comprises an elastomer has a glass transition temperature of less than  $30^\circ\text{C}$  and the elastomer is polysiloxane. However, Speakman discloses a gate dielectric layer is polysiloxane (Speakman col. 3, lines 29-32) and the device is mechanically flexible (elastomer) at low glass transition temperature (Speakman col. 3, line 66 to col. 4, line 5). Speakman teaches the polysiloxane material could be applied by ink jet printing technique leading to a cheaper manufacturing cost (Speakman col. 7, lines 16-25). Therefore, it would have been obvious to one of ordinary skill in the art to modify Ong's device with the teaching of Speakman to provide a elastomer gate dielectric layer of polysiloxane in order to apply the layer with ink jet printing technique leading to a cheaper manufacturing cost.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wsl  
July 26, 2005.

